Muscle stem cells a step closer to treating muscular dystrophy

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Stanford scientists have overcome one significant hurdle in developing a therapy for muscle-wasting diseases like muscular dystrophy. Until now, the muscle stem cells that stand at the ready to repair muscle damage couldn't be grown outside the safe confines of a muscle. Once uprooted from their home and transferred to a laboratory dish, they matured into less useful progenitor cells. That's a problem because once mature the cells no longer have the potential to be transplanted to repair muscle damaged by injury or disease.

Until Helen Blau, CIRM grantee and Stanford"s Donald E. and Delia B. Baxter Professor, had a good idea, that is. According to a Stanford press release:

" The researchers wondered if the way the cells are normally grown in culture could be the problem. After all, as Blau pointed out, cells are used to rubbing shoulders comfortably with their neighbors on all sides rather than being splayed out and anchored on a rigid plastic culture dish that is 100,000-fold less elastic than true muscle.
Blau and her team grew the cells on a hydrogel that mimicked the elasticity of muscle, and voila. In the Stanford press release Blau said:

" "Clearly the cells grown on the more-elastic surfaces have better survival and self-renewing properties than those grown on standard tissue culture dishes. We conducted our experiments with muscle stem cells, but I expect this will be true for other types of adult stem cells as well."
When transplanted into mice, the cells contributed to leg muscles, showing that the cells were not only more numerous but also therapeutically useful. The group said this discovery could pave the way for scientists to grow muscle stem cells in quantities needed for transplantation therapies to treat muscular dystrophy and other muscle diseases.

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